We claim:

1. An isolated epitope comprising the formula

$$[(W)_z - P - (Y)_t - P]_q \qquad \text{Formula (I)}$$

with $(S)_r$ attached to $(Y)_t$

Wherein:

W is any amino acid other than Aspartate and Glutamate

Y is any naturally occurring moiety that is capable of being sulfated

P is $(A)_m(A)_n(X)_u$ or $(X)_u(A)_n(A)_m$ or $(A)_n(X)_u(A)_m$

or $(A)_n(A)_m(X)_u$ or $(X)_u(A)_m(A)_n$ or $(A)_m(X)_u(A)_n$

S is sulfate or a sulfated molecule

X is any amino acid except Aspartate, Glutamate, or Tyrosine

A is any negatively charged amino acid or leucine, isoleucine, proline, phenylalanine, serine, or glycine

q is 1 to 6

z is 0, 1, or 2

r is 0 or 1

t is 1, 2 or 3

u is 0 to 2

n is 0 to 3

m is 0 to 3

wherein if n = 0 then m >0; wherein if m = 0 then n >0; wherein if q is 1, r is 1, and if q is >1 at least one of Y is sulfated; and further wherein the isolated epitope is capable of being bound by an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, comprising a first hypervariable region comprising SEQ ID NO: 20.

2. The isolated epitope of claim 1 wherein the sulfated moiety is a peptido or glyco or lipo conjugate.

3. The isolated epitope of claim 1 wherein:

W is Glycine,

Y is a peptido conjugate of Tyrosine or a glyco conjugate of Asparagine, Serine or Threonine.

A is Glutamate, γ Carboxy Glutamate or Aspartate

q is 1, 2, or 3

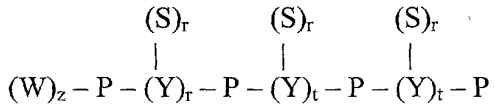
4. The isolated epitope of claim 3 wherein:

Y is a peptido conjugate of Tyrosine

q is 3

r is 1

5. An isolated epitope comprising the formula



Formula II

Wherein:

W is any amino acid other than Aspartate and Glutamate

Y is any naturally occurring moiety that is capable of being sulfated

P is $(A)_m(A)_n(X)_u$ or $(X)_u(A)_n(A)_m$ or $(A)_n(X)_u(A)_m$

or $(A)_n(A)_m(X)_u$ or $(X)_u(A)_m(A)_n$ or $(A)_m(X)_u(A)_n$

S is a sulfate or a sulfated molecule

X is any amino acid except Aspartate, Glutamate or Tyrosine

A is any negatively charged amino acid or leucine, isoleucine, proline, phenylalanine, serine, or glycine

z is 0, 1, or 2

r is 0 or 1

t is 1, 2 or 3

u is 0 to 2

n is 0 to 3

m is 0 to 3

wherein if n =0 then m > 0; wherein if m = 0 then n > 0; wherein at least one Y is sulfated; and further wherein the isolated epitope is capable of being bound by an antibody, antigen-binding fragment thereof, or complex thereof comprising at

least one antibody or binding fragment thereof, comprising a first hypervariable region comprising SEQ ID NO: 20.

6. The isolated epitope of claim 5 wherein the sulfated moiety is a peptido or glyco or lipo conjugate.

7. The isolated epitope of claim 5 wherein:

W is Glycine

Y is a peptide conjugate of Tyrosine or a glyco conjugate of Asparagine, Serine or Threonine

A is Glutamate, γ Carboxy Glutamate or Aspartate, Leucine, Isoleucine, Proline, Phenylalanine, serine, or glycine.

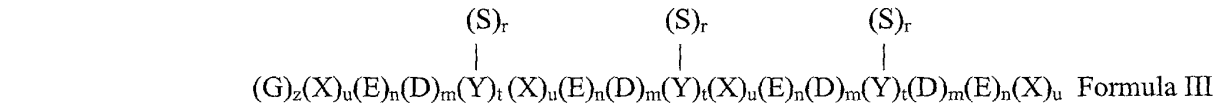
8. The isolated epitope of claim 7 wherein:

Y is a peptido conjugate of Tyrosine

q is 3; and

r is 1

9. An isolated epitope comprising the formula



$$(G)_z(X)_u(E)_n(D)_m(Y)_t(X)_u(E)_n(D)_m(Y)_t(X)_u(E)_n(D)_m(Y)_t(D)_m(E)_n(X)_u$$

Formula III

Wherein:

G is Glycine

E is Glutamate

D is Aspartate

Y is Tyrosine

S is sulfate or a sulfated molecule

X is any amino acid except the above

z is 0, 1, or 2

t is 1, 2 or 3

r is 0 or 1

u is 0 to 2

n is 0 to 3

m is 0 to 3

wherein at least one Y is sulfated; wherein if n = 0 then m > 0; wherein if m = 0 then n > 0; and further wherein the isolated epitope is capable of being bound by an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, comprising a first hypervariable region comprising SEQ ID NO: 20.

10. The isolated epitope of claim 9 wherein r is 1.

11. The isolated epitope of any one of claims 1-8, wherein the naturally occurring moiety that is capable of being sulfated Y comprises a lipid, carbohydrate, peptide, glycolipid, glycoprotein, lipoprotein, and/ or lipopolysaccharide molecule.

12. A homolog or mimetic of the isolated epitope of any one of claims 1-10.

13. The isolated epitope of any one of claims 1-10, wherein the isolated epitope comprises at least one post-translational modification in addition to sulfation.

14. A composition comprising the isolated epitope of any one of claims 1-10.

15. The composition of claim 14 further comprising an upstream or downstream region capable of improving the binding capacity of the epitope.

16. The composition of claim 15, wherein the upstream or downstream region is proximate to the epitope.

17. An isolated polynucleotide encoding at least a portion of the isolated epitope of any one of claims 1-10.

18. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, capable of binding to or cross reacting with the isolated epitope of claim 1.

19. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, capable of binding to or cross reacting with the isolated epitope of claim 5.

20. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, capable of binding to or cross reacting with the isolated epitope of claim 9.

21. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, capable of binding to or cross reacting with the isolated epitope of any of claims 2-4, 6-8, or 10-13.

22. A process for producing an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, capable of binding to or cross reacting with the isolated epitope of any of claims 1-13, comprising the steps of

(a) providing a phage display library;

(b) providing an isolated epitope according to any one of claims 1-13;

(c) panning the phage display library for a phage particle displaying an oligopeptide or polypeptide capable of binding to the isolated epitope; and

(d) producing an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof comprising an antibody or binding fragment thereof, comprising the peptide or polypeptide capable of binding to the isolated epitope.

(e) An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, having the binding capabilities of the scFv antibody fragment of SEQ ID NO: 203.

23
24. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, having the binding capabilities of a peptide or polypeptide, wherein the peptide or polypeptide comprises a first hypervariable region comprising or SEQ ID NO: 20.

24 ~~25~~. The antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof of any one of claims 23-24, further wherein the peptide or polypeptide has a second hypervariable region comprising SEQ ID NO: 115 and/ or a third hypervariable region comprising SEQ ID NO: 114.

25 ~~26~~. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof comprising an antibody or binding fragment thereof, that is capable of binding to a peptide or polypeptide epitope of about 3 to about 126 amino acid residues in length and comprising at least 2 acidic amino acids and at least one sulfated tyrosine residue.

26 ~~27~~. The antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 26, wherein the epitope further comprises a proline, leucine, isoleucine, serine, glycine, or phenylalanine residue.

27 ~~28~~. The antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of any of claims 23-27, wherein the antibody or antigen-binding fragment thereof further is capable of binding to an epitope on a carbohydrate, peptide, glycolipid, glycoprotein, lipoprotein, and/ or lipopolysaccharide molecule.

28 ~~29~~. The antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 28, further wherein the epitope on the carbohydrate, peptide, glycolipid, glycoprotein, lipoprotein, and/ or lipopolysaccharide molecule comprises at least one sulfated moiety.

29 ~~30~~. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, that is capable of binding to at least two different molecules selected from the group consisting of PSGL-1, fibrinogen gamma prime (γ'), GP1bα, heparin, lumican, complement compound 4 (CC4), interalpha inhibitor, and prothrombin.

30 ~~31~~. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, that is capable of binding to at least two different molecules selected from the group consisting of PSGL-1, fibrinogen gamma prime (γ'), GP1bα, heparin, lumican, complement compound 4 (CC4), interalpha inhibitor, and prothrombin and is capable of binding to at least one cell type selected from the group consisting of B-CLL cells, AML cells, multiple myeloma cells, and metastatic cells.

31 ~~32~~. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 31, that is capable of binding to each of PSGL-1, fibrinogen gamma prime (γ'), GP1bα, and heparin.

32 ~~33~~. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 32, capable of binding to each of PSGL-1, fibrinogen gamma prime (γ'), GP1bα, and heparin and is

capable of binding to at least one cell type selected from the group consisting of B-CLL cells, AML cells, multiple myeloma cells, and metastatic cells.

34. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, that is capable of binding to at least two different molecules selected from the group consisting of PSGL-1, fibrinogen gamma prime (γ'), GP1bα, heparin, lumican, complement compound 4 (CC4), interalpha inhibitor, and prothrombin and further is capable of binding to an epitope on a lipid, carbohydrate, peptide, glycolipid, glycoprotein, lipoprotein, and/ or lipopolysaccharide molecule.

35. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 34, further wherein the epitope on the lipid, carbohydrate, peptide, glycolipid, glycoprotein, lipoprotein, and/ or lipopolysaccharide molecule comprises at least one sulfated moiety.

36. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, that is capable of crossreacting with two or more epitopes, each epitope comprising one or more sulfated tyrosine residues and at least one cluster of two or more acidic amino acids.

37. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 36 that is capable of crossreacting with PSGL-1.

38. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 37 that binds to QATEYEYLDYDFLPETE wherein at least one tyrosine residue is sulfated.

39. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 36 that is capable of crossreacting with GP1b-α.

40. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 36 that binds to DEGDTDLYDYYPEEDTEGD wherein at least one tyrosine residue is sulfated.

41. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 39 that binds to TDLYDYYPEEDTE wherein at least one tyrosine residue is sulfated.

42. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 39 that binds to DEGDTDLYDYYP wherein at least one tyrosine residue is sulfated.

43. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 39 that binds to YDYYPEE wherein at least one tyrosine residue is sulfated.

44. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 39 that binds to TDLYDYYP wherein at least one tyrosine residue is sulfated.

45. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 36 that is capable of crossreacting with fibrinogen gamma prime (γ').

46. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 45 that binds to EPHAETEYDSLYPED wherein at least one tyrosine residue is sulfated.

47. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 36 that is capable of crossreacting with heparin.

48. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 36 that is capable of crossreacting with complement compound 4 (CC4).

49. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 48 that binds to MEANEDYEDYEYDELPAK wherein at least one tyrosine residue is sulfated.

50. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, of claim 36 that is capable of crossreacting with at least one cell type selected from the group consisting of B-CLL cells, AML cells, multiple myeloma cells, and metastatic cells.

51. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting cell rolling.

52. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting inflammation.

53. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting auto-immune disease.

54. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting thrombosis.

55. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting restenosis.

56. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting metastasis.

57. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting growth and/ or replication of tumor cells.

58. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of increasing mortality of tumor cells.

59. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting growth and/ or replication of leukemia cells.

60. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of increasing the mortality rate of leukemia cells.

61. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of increasing the susceptibility of diseased cells to damage by anti-disease agents.

62. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of increasing the susceptibility of tumor cells to damage by anti-cancer agents.

63. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of increasing the susceptibility of leukemia cells to damage by anti-leukemia agents.

64. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting increase in number of tumor cells in a patient having a tumor.

65. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of decreasing the number of tumor cells in a patient having cancer.

66. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting increase in number of leukemia cells in a patient having leukemia.

67. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of decreasing the number of leukemia cells in a patient having leukemia.

68. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting cell-cell, cell-matrix, platelet-matrix, platelet-platelet, and/ or cell-platelet complex formation.

69. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting cell-cell, cell-matrix, platelet-matrix, platelet-platelet, and/ or cell-platelet adhesion.

70. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 that is capable of inhibiting cell-cell, cell-matrix, platelet-matrix, platelet-platelet, and/ or cell-platelet aggregation.

71. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 coupled to or complexed with an agent selected from the group consisting of anti-cancer, anti-metastasis, anti-leukemia, anti-disease, anti-adhesion, anti-thrombosis, anti-restenosis, anti-autoimmune, anti-aggregation, anti-bacterial, anti-viral, and anti-inflammatory agents.

72. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 71, wherein the agent is an anti-viral agent selected from the group consisting of acyclovir, ganciclovir and zidovudine.

73. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 71, wherein the agent is an anti-thrombosis/ anti- restenosis agent selected from the group consisting of cilostazol, dalteparin sodium, reviparin sodium, and aspirin.

74. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 71, wherein the agent is an anti-inflammatory agent selected from the group consisting of zaltoprofen, pranoprofen, droxicam, acetyl salicylic 17, diclofenac, ibuprofen, dexibuprofen, sulindac, naproxen, amtolmetin, celecoxib, indomethacin, rofecoxib, and nimesulid.

75. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 71, wherein the agent is an anti-autoimmune agent selected from the group consisting of leflunomide, denileukin diftitox, subreum, WinRho SDF, defibrotide, and cyclophosphamide.

76. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 71, wherein the

agent is an anti-adhesion/anti-aggregation agent selected from the group consisiting of limaprost, clorcromene, and hyaluronic acid.

77. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 71 wherein the agent is selected from the group consisting of toxins, radioisotopes, and pharmaceutical agents.

78. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 77 wherein the toxin is selected from the group consisting of gelonin, *Pseudomonas* exotoxin (PE), PE40, PE38, ricin, and modifications and derivatives thereof.

79. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 77 wherein the radioisotope is selected from the group consisting of gamma-emitters, positron-emitters, x-ray emitters, beta-emitters, and alpha-emitters.

80. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 77 wherein the radioisotope is selected from the group consisting of ^{111}indium, ^{113}indium, ^{99m}rhenium, ^{105}rhenium, ^{101}rhenium, ^{99m}technetium, ^{121m}tellurium, ^{122m}tellurium, ^{125m}telluriunm ^{165}thulium, ^{167}thulium ^{168}thulium ^{123}iodine, ^{126}iodine, ^{131}iodine, ^{133}iodine, ^{81m}krypton, ^{33}xenon, ^{90}yttrium, ^{213}bismuth, ^{77}bromine, ^{18}fluorine, ^{95}ruthenium, ^{97}ruthenium, ^{103}ruthenium, ^{105}ruthenium, ^{107}mercury, ^{203}mercury, ^{67}gallium and ^{68}gallium.

81. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 77 wherein the pharmaceutical agent is selected from the group consisting of doxorubicin, methoxymorpholinyldoxorubicin (morpholinodoxorubicin), adriamycin, cis-platinum, taxol, calicheamicin, vincristine, cytarabine (Ara-C), cyclophosphamide, prednisone, daunorubicin, idarubicin, fludarabine,

chlorambucil, interferon alpha, hydroxyurea, temozolomide, thalidomide and bleomycin, and derivatives and combinations thereof.

82. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 coupled to or complexed with a vehicle or carrier that is capable of being coupled or complexed to more than one agent.

83. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 wherein the vehicle or carrier is selected from the group consisting of dextran, lipophilic polymers, HPMA, and liposomes.

84. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any of claims 23 or 24 coupled to or complexed with a radioactive isotope or other imaging agent.

85. A diagnostic kit comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 84.

86. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit cell rolling.

87. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit inflammation.

88. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment

thereof, according to any one of claims 23 or 24 in an amount effective to inhibit auto-immune disease.

89. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit thrombosis.

90. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit restenosis.

91. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit metastasis.

92. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit growth and/ or replication of tumor cells.

93. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to increase mortality of tumor cells.

94. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit growth and/ or replication of leukemia cells.

95. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to increase the mortality rate of leukemia cells.

96. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to increase the susceptibility of diseased cells to damage by anti-disease agents.

97. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to increase the susceptibility of tumor cells to damage by anti-cancer agents.

98. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to increase the susceptibility of leukemia cells to damage by anti-leukemia agents.

99. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit increase in number of tumor cells in a patient having a tumor.

100. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to decrease number of tumor cells in a patient having a tumor.

101. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit increase in number of leukemia cells in a patient having leukemia.

102. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to decrease number of leukemia cells in a patient having leukemia.

103. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit cell-cell, cell-matrix, platelet-matrix, platelet-platelet, and/ or cell-platelet aggregation.

104. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit cell-cell, cell-matrix, platelet-matrix, platelet-platelet, and/ or cell-platelet complex formation.

105. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 in an amount effective to inhibit cell-cell, cell-matrix, platelet-matrix, platelet-platelet, and/ or cell-platelet adhesion.

106. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 coupled to or complexed with an agent selected from the group consisting of anti-cancer, anti-metastasis, anti-leukemia, anti-disease, anti-adhesion, anti-thrombosis, anti-restenosis,anti-autoimmune, anti-aggregation, anti-bacterial, anti-viral, and anti-inflammatory agents.

107. The pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding

fragment thereof, according to claim 106, wherein the agent is an anti-viral agent selected from the group consisting of acyclovir, ganciclovir and zidovudine.

108. The pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 106, wherein the agent is an anti-thrombosis/ anti- restenosis agent selected from the group consisting of cilostazol, dalteparin sodium, reviparin sodium, and aspirin.

109. The pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 106, wherein the agent is an anti-inflammatory agent selected from the group consisting of zaltoprofen, pranoprofen, droxicam, acetyl salicylic 17, diclofenac, ibuprofen, dexibuprofen, sulindac, naproxen, amtolmetin, celecoxib, indomethacin, rofecoxib, and nimesulid.

110. The pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 106, wherein the agent is an anti-autoimmune agent selected from the group consisting of leflunomide, denileukin diftitox, subreum, WinRho SDF, defibrotide, and cyclophosphamide.

111. The pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to claim 106, wherein the agent is an anti-adhesion/anti-aggregation agent selected from the group consisiting of limaprost, clorcromene, and hyaluronic acid.

112. A pharmaceutical composition according to claim 106 wherein the agent is selected from the group consisting of toxins, radioisotopes, and pharmaceutical agents.

113. A pharmaceutical composition according to claim 106 wherein the toxin is selected from the group consisting of gelonin, *Pseudomonas* exotoxin (PE), PE40, PE38, ricin, and modifications and derivatives thereof.

114. A pharmaceutical composition according to claim 106 wherein the radioisotope is selected from the group consisting of gamma-emitters, positron-emitters, x-ray emitters, beta-emitters, and alpha-emitters.

115. A pharmaceutical composition according to claim 106 wherein the radioisotope is selected from the group consisting of ^{111}indium, ^{113}indium, ^{99m}rhenium, ^{105}rhenium, ^{101}rhenium, ^{99m}technetium, ^{121m}tellurium, ^{122m}tellurium, ^{125m}telluriunm ^{165}thulium, ^{167}thulium ^{168}thulium ^{123}iodine, ^{126}iodine, ^{131}iodine, ^{133}iodine, ^{81m}krypton, ^{33}xenon, ^{90}yttrium, ^{213}bismuth, ^{77}bromine, ^{18}fluorine, ^{95}ruthenium, ^{97}ruthenium, ^{103}ruthenium, ^{105}ruthenium, ^{107}mercury, ^{203}mercury, ^{67}gallium and ^{68}gallium.

116. A pharmaceutical composition according to claim 106 wherein the pharmaceutical agent is selected from the group consisting of doxorubicin, methoxymorpholinyldoxorubicin (morpholinodoxorubicin), adriamycin, cis-platinum, taxol, calicheamicin, vincristine, cytarabine (Ara-C), cyclophosphamide, prednisone, daunorubicin, idarubicin, fludarabine, chlorambucil, interferon alpha, hydroxyurea, temozolomide, thalidomide and bleomycin, and derivatives and combinations thereof.

117. A pharmaceutical composition, comprising an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 coupled to or complexed with a vehicle or carrier that is capable of being coupled or complexed to more than one agent.

118. A pharmaceutical composition according to claim 117 wherein the vehicle or carrier is selected from the group consisting of dextran, lipophilic polymers, HPMA, and liposomes.

119. A method of inhibiting cell rolling, comprising administering to a patient in need thereof a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

120. A method of inhibiting inflammation, comprising administering to a patient in need thereof a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

121. A method of inhibiting auto-immune disease, comprising administering to a patient in need thereof a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

122. A method of inhibiting thrombosis, comprising administering to a patient in need thereof a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

123. A method of inhibiting restenosis, comprising administering to a patient in need thereof a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

124. A method of inhibiting metastasis, comprising administering to a patient in need thereof a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

125. A method of inhibiting growth and/ or replication of tumor cells, comprising administering to a patient in need thereof, a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

126. A method of increase the mortality rate of tumor cells, comprising administering to a patient in need thereof, a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

127. A method of inhibiting growth and/ or replication of leukemia cells, comprising administering to a patient in need thereof, a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

128. A method of increasing the mortality rate of leukemia cells, comprising administering to a patient in need thereof, a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

129. A method of increasing the susceptibility of diseased cells to damage by anti-disease agents, comprising administering to a patient in need thereof, a pharmaceutical composition comprising an effective amount of an antibody,

antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

130. A method of increasing the susceptibility of tumor cells to damage by anti-cancer agents, comprising administering to a patient in need thereof, a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

131. A method of increasing the susceptibility of leukemia cells to damage by anti-cancer agents, comprising administering to a patient in need thereof, a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

132. A method of inhibiting increase in number of tumor cells in a patient having a tumor, comprising administering to a patient in need thereof, a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 .

133. A method of decreasing number of tumor cells in a patient having a tumor, comprising administering to a patient in need thereof, a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

134. A method of inhibiting increase in number of leukemia cells in a patient having leukemia, comprising administering to a patient in need thereof, a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24 .

135. A method of decreasing number of leukemia cells in a patient having leukemia, comprising administering to a patient in need thereof, a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

136. A method of inhibiting cell-cell, cell-matrix, platelet-matrix, platelet-platelet, and/or cell-platelet complex formation, comprising administering to a patient in need thereof a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

137. A method of inhibiting cell-cell, cell-matrix, platelet-matrix, platelet-platelet, and/or cell-platelet aggregation, comprising administering to a patient in need thereof a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

138. A method of inhibiting cell-cell, cell-matrix, platelet-matrix, platelet-platelet, and/or cell-platelet adhesion, comprising administering to a patient in need thereof a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

139. A method of ameliorating the effects of a disease, preventing a disease, treating a disease, or inhibiting the progress of a disease, comprising administering to a patient in need thereof a pharmaceutical composition comprising an effective amount of an antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, according to any one of claims 23 or 24.

140. A method according to claim 139, wherein the antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, is coupled to or complexed with an agent selected from the group consisting of anti-cancer, anti-metastasis, anti-leukemia, anti-disease, anti-adhesion, anti-thrombosis, anti-restenosis, anti-autoimmune, anti-aggregation, anti-bacterial, anti-viral, and anti-inflammatory agents.

141. The method of claim 140, wherein the agent is an anti-viral agent selected from the group consisting of acyclovir, ganciclovir and zidovudine.

142. The method of claim 140, wherein the agent is an anti-thrombosis/ anti- restenosis agent selected from the group consisting of cilostazol, dalteparin sodium, reviparin sodium, and aspirin.

143. The method of claim 140, wherein the agent is an anti-inflammatory agent selected from the group consisting of zaltoprofen, pranoprofen, droxicam, acetyl salicylic 17, diclofenac, ibuprofen, dexibuprofen, sulindac, naproxen, amtolmetin, celecoxib, indomethacin, rofecoxib, and nimesulid.

144. The method of claim 140, wherein the agent is an anti-autoimmune agent selected from the group consisting of leflunomide, denileukin diftitox, subreum, WinRho SDF, defibrotide, and cyclophosphamide.

145. The method of claim 140, wherein the agent is an anti-adhesion/anti-aggregation agent selected from the group consisiting of limaprost, clorcromene, and hyaluronic acid.

146. The method of claim 140, wherein the agent is selected from the group consisting of toxins, radioisotopes, and pharmaceutical agents.

147. The method of claim 140, wherein the toxin is selected from the group consisting of gelonin, *Pseudomonas* exotoxin (PE), PE40, PE38, ricin, and modifications and derivatives thereof.

148. The method of claim 140, wherein the radioisotope is selected from the group consisting of gamma-emitters, positron-emitters, x-ray emitters, beta-emitters, and alpha-emitters.

149. The method of claim 140, wherein the radioisotope is selected from the group consisting of ^{111}indium, ^{113}indium, ^{99m}rhenium, ^{105}rhenium, ^{101}rhenium, ^{99m}technetium, ^{121m}tellurium, ^{122m}tellurium, ^{125m}telluriunm ^{165}thulium, ^{167}thulium ^{168}thulium ^{123}iodine, ^{126}iodine, ^{131}iodine, ^{133}iodine, ^{81m}krypton, ^{33}xenon, ^{90}yttrium, ^{213}bismuth, ^{77}bromine, ^{18}fluorine, ^{95}ruthenium, ^{97}ruthenium, ^{103}ruthenium, ^{105}ruthenium, ^{107}mercury, ^{203}mercury, ^{67}gallium and ^{68}gallium.

150. The method of claim 140, wherein the pharmaceutical agent is selected from the group consisting of doxorubicin, methoxymorpholinyldoxorubicin (morpholinodoxorubicin), adriamycin, cis-platinum, taxol, calicheamicin, vincristine, cytarabine (Ara-C), cyclophosphamide, prednisone, daunorubicin, idarubicin, fludarabine, chlorambucil, interferon alpha, hydroxyurea, temozolomide, thalidomide and bleomycin, and derivatives and combinations thereof.

151. The method according to claim 139, wherein the antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof, is coupled to or complexed with a vehicle or carrier that is capable of being coupled or complexed to more than one agent.

152. The method according to claim 151, wherein the vehicle or carrier is selected from the group consisting of dextran, lipophilic polymers, HPMA, and liposomes.

153. An isolated epitope comprising GPIbα amino acid sequence Tyr 276 to Glu 282, wherein at least one of amino acids 276, 278 and 279 is sulfated.

154. The isolated epitope of claim 153 further comprising GPIbαamino acids 283-285.

155. An antibody, antigen-binding fragment thereof, or complex thereof comprising at least one antibody or binding fragment thereof that is capable of binding to the

epitope of claim 153, wherein the binding is enhanced when the epitope of claim 153 further comprises GPIbαamino acids 283-285.

156. An isolated GP1bα N-terminal peptide having an apparent molecular weight of about 40 KDa, said peptide comprising an epitope having the sequence YDYYPEE, wherein at least one tyrosine residue in the epitope is sulfated.

157. An isolated GP1bα peptide consisting of amino acids 1 through 282, wherein at least one of amino acids 276, 278 and 279 is sulfated..

158. A polyclonal antibody, antibody fragment or antibody complex that cross-reacts with the variable light chain of human monoclonal antibody scFv Y1.

159. The polyclonal antibody, antibody fragment or antibody complex of claim 158 that cross-reacts with a *Nde*I-*Eco*R1 restriction fragment of the variable light chain of human monoclonal antibody Y-1.

160. A diagnostic kit comprising the antibody or antibody fragment or complex of any of claims158-159.

161. A composition comprising the antibody or antibody fragment or complex of any of claims158-159 conjugated to doxirubicin.

162. A composition comprising the antibody or antibody fragment or complex of any of claims158-159 and a pharmaceutically acceptable carrier selected from the group consisting of dextran, HPMA, and lipophilic polymers.

163. A composition comprising the antibody or antibody fragment or complex of any of claims158-159 admixed with a doxirubicin-decorated liposome.